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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,874	07/14/2003	Hideki Kitao	50710/DBP/A400	7817
23363 7590 06/20/2007 CHRISTIE, PARKER & HALE, LLP PO BOX 7068 PASADENA, CA 91109-7068			EXAMINER WOZNIAK, JAMES S	
			ART UNIT 2626	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/619,874	<b>Applicant(s)</b> KITAO ET AL.	
	<b>Examiner</b> James S. Wozniak	<b>Art Unit</b> 2626	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Information Disclosure Statement*

1. The information disclosure statement filed 12/14/2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language (*specifically JP 60-75900*). It has been placed in the application file, but the information referred to therein has not been considered.

### *Claim Objections*

2. **Claims 2 and 5-10** are objected to because of the following informalities:

In claim 2, the variable “j” in the recited equation has not been defined. This variable should be defined in order to clarify its meaning in the claim and to prevent confusion with the variable “J”.

In claims 4 and 5, line 4 “the level” should be changed to --a level-- in order to provide proper antecedent basis for this limitation in the claim.

The dependent claims fail to overcome the objections directed to their parent claims, and thus, are also objected to due to minor informalities.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1 and 4** are rejected under 35 U.S.C. 102(b) as being anticipated by Stettiner et al (*U.S. Patent: 4,959,865*).

With respect to **Claim 1**, Stettiner discloses:

Preprocessing means for removing noise contained in a speech signal (*low-pass filter for removing noise, Col. 3, Lines 53-58*);

Signal-to-noise ratio improving means for improving the signal-to-noise ratio of said speech signal from which noise has been removed by said preprocessing means (*short-term auto-correlation means that suppresses peaks due to non-speech factors, Col. 4, Lines 47-68*); and

Speech section extracting signal generating means for generating a speech section extracting signal based on said speech signal whose signal-to-noise ratio has been improved by said signal-to-noise improving means (*speech presence decision, Col. 6, Line 25- Col. 7, Line 25, which produces an extracted speech signal by closing a switch to pass a detected speech segment and opening a switch to block non-speech segments, Col. 3, Lines 20-24*).

With respect to **Claim 4**, Stettiner further discloses:

Speech section extracting signal generating means sets said speech section extracting signal open when the level of said speech signal whose signal-to-noise ratio has been improved

by said signal-to-noise ratio improving means has continued to stay above a predetermined threshold value for a predetermined length of time (*determination of pitch consistency longer than a predetermined duration, Col. 7, Lines 39-54, which corresponds to autocorrelation values exceeding a threshold longer than a predetermined duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25; and the switch taught by Stettiner and applied to claim 1 that passes a speech signal as a result of such a continually exceeded threshold*).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 2, 5, and 8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Stettiner et al in view of Iizuka et al (*U.S. Patent: 6,952,670*).

With respect to **Claim 2**, Stettiner discloses the speech presence determiner that calculates and utilizes a short-term auto-correlation value in speech period detection, as applied to Claim 1. Stettiner further discloses the use of a low-pass filter, as applied to Claim 1. Stettiner does not explicitly disclose an equation used to calculate such an auto-correlation value, specifically the equation recited in claim 2. Iizuka, however, discloses a noise/speech segment determination apparatus that utilizes an equation similar to the one recited in claim 2 to determine an auto-correlation coefficient (*Col. 26, Lines 17-30*).

Stettiner and Iizuka are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Stettiner with the auto-correlation coefficient calculating equation taught by Iizuka in order to provide a specific well-known means for obtaining parameters for rendering a decision about the presence or absence of speech within an audio signal (*Stettiner, Col. 4, Lines 47-50*) with a high level of reliability (*Iizuka, Col. 6, Lines 20-25*).

With respect to **Claim 5**, Stettiner further discloses:

The speech section extracting signal generating means sets said speech section extracting signal open when the level of said short-time auto-correlation value calculated by said short-time auto-correlation value calculating means has continued to stay above a predetermined threshold value for a predetermined length of time (*determination of pitch consistency longer than a predetermined duration, Col. 7, Lines 39-54, which corresponds to autocorrelation values exceeding a threshold longer than a predetermined duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25; and the switch taught by Stettiner and applied to claim 1 that passes a speech signal as a result of such a continually exceeded threshold*).

With respect to **Claim 8**, Stettiner further discloses:

Extracting signal opening means for setting said extracting signal open when said short-time auto-correlation value calculated by said short-time auto-correlation value calculating means has continued to stay above a predetermined threshold value for a predetermined length of time (*determination of pitch consistency longer than a predetermined duration, Col. 7, Lines 39-54, which corresponds to autocorrelation values exceeding a threshold longer than a*

*predetermined duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25; and the switch taught by Stettiner and applied to claim 1 that passes a speech signal as a result of such a continually exceeded threshold); and*

Extracting signal retroactively opening means for outputting said speech section extracting signal by setting said extracting signal open retroactively over a predetermined period when said extracting signal has been set open by said extracting signal opening means (*backwards extension, Col. 7, Line 55- Col. 8, Line 37*).

With respect to **Claim 9**, Stettiner further discloses:

Extracting signal opening means for setting said extracting signal open when said short-time auto-correlation value calculated by said short-time auto-correlation value calculating means has continued to stay above a predetermined threshold value for a predetermined length of time (*determination of pitch consistency longer than a predetermined duration, Col. 7, Lines 39-54, which corresponds to autocorrelation values exceeding a threshold longer than a predetermined duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25; and the switch taught by Stettiner and applied to claim 1 that passes a speech signal as a result of such a continually exceeded threshold); and*

Extracting signal open state maintaining means for outputting said speech section extracting signal by maintaining said extracting signal in an open state for a predetermined period, even after said extracting signal is closed, when said extracting signal has been set open by said extracting signal opening means (*forward extension, Col. 7, Line 55- Col. 8, Line 43*).

**Claim 10** contains subject matter similar to Claims 8 and 9, and thus, is rejected for the same reasons.

7. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Stettiner et al in view of Shinta et al (*U.S. Patent: 5,315,704*).

With respect to **Claim 3**, Stettiner discloses the speech presence determiner that utilizes a low-pass filter, as applied to Claim 1. Stettiner does not explicitly teach that a high-pass filter is utilized in addition to a low-pass filter, however, Shinta discloses the use of such filters in a speech discriminator (*Col. 8, Lines 60-65*).

Stettiner and Shinta are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Stettiner with the high-pass filter taught by Shinta in order to cut-off low frequency noise to further focus speech detection processing on the specific frequency band referred to by Stettiner (*Col. 3, Lines 53-58*).

8. **Claims 6/4/1** is rejected under 35 U.S.C. 103(a) as being unpatentable over Stettiner et al in view of Junqua (*U.S. Patent: 5,305,422*).

With respect to **Claim 6/4/1**, Stettiner discloses the speech presence determiner that utilizes a threshold decision for short-term autocorrelations, as applied to Claim 1. Stettiner does not explicitly teach that a threshold can be updated in a non-speech region by multiplying an average signal level by a predetermined factor. Such threshold updating processes are well-known in the art, however, as is evidenced by Junqua (*multiplying an average energy in a non-speech region by a predetermined factor to set a new threshold, Col. 2, Lines 32-41*).

Stettiner and Junqua are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in



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the art, at the time of invention, to modify the teachings of Stettiner with the threshold updating means taught by Junqua in order to implement a speech detection system that is capable of adapting to a variety of noise environments (*Junqua, Col. 1, Lines 50-58*).

9. **Claims 6/5/2/1 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Stettiner et al in view of Iizuka et al and further in view of Junqua.

With respect to **Claim 6/5/2/1**, Stettiner in view of Iizuka discloses the speech presence determiner that utilizes a threshold decision for short-term autocorrelations, as applied to Claim 5. Stettiner in view of Iizuka does not explicitly teach that a threshold can be updated in a non-speech region by multiplying an average signal level by a predetermined factor. Such threshold updating processes are well-known in the art, however, as is evidenced by Junqua (*multiplying an average energy in a non-speech region by a predetermined factor to set a new threshold, Col. 2, Lines 32-41*).

Stettiner, Iizuka, and Shinta are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Stettiner in view of Iizuka with the threshold updating means taught by Junqua in order to implement a speech detection system that is capable of adapting to a variety of noise environments (*Junqua, Col. 1, Lines 50-58*).

With respect to **Claim 7**, Stettiner in view of Iizuka discloses the speech presence determiner that utilizes a threshold decision for short-term autocorrelations, as applied to Claim 5. Stettiner in view of Iizuka does not explicitly teach that a threshold can be updated in a non-

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speech region by multiplying a smoothed RMS by a predetermined factor. Such threshold updating processes are well-known in the art, however, as is evidenced by Junqua (*multiplying a calculated average (i.e., smoothed) RMS correlation difference by a predetermined factor to set a new threshold, Col. 2, Lines 32-41*).

Stettiner, Iizuka, and Shinta are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Stettiner in view of Iizuka with the threshold updating means taught by Junqua in order to implement a speech detection system that is capable of adapting to a variety of noise environments (*Junqua, Col. 1, Lines 50-58*).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Nakato et al (*U.S. Patent: 5,611,019*)- discloses a method for determining whether a signal is speech or non-speech.

Mizuno et al (*U.S. Patent: 5,732,392*)- discloses a speech detection method utilizing short-time autocorrelation analysis.

Nakadai et al (*U.S. Patent: 5,732,394*)- teaches a word spotting system utilizing short-time autocorrelation analysis.

Inoue (*U.S. Patent: 5,819,209*)- discloses a method for pitch period extraction utilizing short-time auto-correlative values.

Zhang et al (*U.S. Patent: 6,640,208*)- discloses a voiced/unvoiced speech classifier utilizing a threshold value adjuster.

Strauss et al (*U.S. Publication: 2002/0116186*)- teaches a system for voice activity detection.

Krusback et al (*"An Autocorrelation Pitch Detector and Voicing Decision with Confidence Measures Developed for Noise-Corrupted Speech," 1991*)- teaches a method for generating a voicing decision using an autocorrelation function.

Hirose et al (*"A Scheme for Pitch Extraction of Speech Using Autocorrelation Function with Frame Length Proportional to the Time Lag," 1992*)- discloses a method for pitch extraction of a speech signal using a short-time autocorrelation function.

Lee et al (*"A Voice Activity Detection Algorithm for Communication Systems with Dynamically Varying Background Acoustic Noise," 1998*)- teaches a method for voice activity detection using short-time autocorrelation analysis.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak  
6/7/2007



**PATRICK N. EDOUARD**  
**SUPERVISORY PATENT EXAMINER**